

WHAT IS CLAIMED IS:

- 1                    1.     An isolated nucleic acid encoding an estrogen-regulated GTP-  
2 binding protein gamma-12 subunit protein, wherein the protein comprises the amino acid  
3 sequence of SEQ ID NO:1.
- 1                    2.     The nucleic acid of claim 1, wherein the nucleic acid is from a  
2 mouse.
- 1                    3.     The nucleic acid of claim 1, wherein the nucleic acid comprises a  
2 nucleotide sequence that is at least about 70% identical to SEQ ID NO:2 or 3.
- 1                    4.     The nucleic acid of claim 1, wherein the nucleic acid comprises the  
2 nucleotide sequence of SEQ ID NO:2 or 3.
- 1                    5.     An expression cassette comprising the nucleic acid of claim 1.
- 1                    6.     An isolated eukaryotic cell comprising the expression cassette of  
2 claim 5.
- 1                    7.     An isolated estrogen-regulated GTP-binding protein gamma-12  
2 subunit protein, wherein the protein comprises the amino acid sequence of SEQ ID NO:1.
- 1                    8.     The protein of claim 7, wherein the protein is a mouse protein.
- 1                    9.     An antibody that selectively binds to the estrogen-regulated GTP-  
2 binding protein gamma-12 subunit protein of claim 7, wherein the antibody does not bind  
3 to the estrogen-regulated GTP-binding protein gamma-12 subunit protein having the  
4 amino acid sequence of SEQ ID NO:4.
- 1                    10.    A method of modulating estrogen signaling in a mammalian cell,  
2 the method comprising modulating the level of expression or activity of an estrogen-  
3 regulated GTP-binding protein gamma-12 subunit protein.
- 1                    11.    The method of claim 10, wherein said level of expression of said  
2 estrogen-regulated GTP-binding protein gamma-12 subunit protein is modulated by  
3 introducing a polynucleotide into said cell, whereby the presence or expression of said  
4 polynucleotide modulates said level of expression of said estrogen-regulated GTP-  
5 binding protein gamma-12 subunit protein.

1                   12.     The method of claim 11, wherein said polynucleotide encodes a  
2     full-length estrogen-regulated GTP-binding protein gamma-12 subunit protein, and  
3     wherein expression of said polynucleotide increases said level of expression of said  
4     estrogen-regulated GTP-binding protein gamma-12 subunit protein.

1                   13.     The method of claim 11, wherein said polynucleotide is an  
2     antisense sequence, and wherein the presence or expression of said polynucleotide  
3     decreases said level of expression of said estrogen-regulated GTP-binding protein  
4     gamma-12 subunit protein.

1                   14.     The method of claim 10, wherein a compound is administered to  
2     said cell, whereby said level of said expression or activity of said estrogen-regulated  
3     GTP-binding protein gamma-12 subunit is modulated.

1                   15.     The method of claim 10, wherein the estrogen signaling is  
2     mediated by an estrogen receptor alpha.

1                   16.     The method of claim 10, wherein the cell is present in a mammal.

1                   17.     The method of claim 16, wherein the cell is a vascular smooth  
2     muscle cell or a vascular endothelial cell.

1                   18.     The method of claim 16, wherein said level of expression or  
2     activity of said estrogen-regulated GTP-binding protein gamma-12 subunit protein is  
3     increased, whereby the development of atherosclerosis, osteoporosis, Alzheimer's disease  
4     or Parkinson's disease is inhibited in said mammal.

1                   19.     A method of detecting the presence of estrogen signaling in a  
2     mammalian cell, the method comprising detecting the expression of a nucleic acid  
3     encoding an estrogen-regulated GTP-binding protein gamma-12 subunit protein.

1                   20.     The method of claim 19, wherein said nucleic acid is the nucleic  
2     acid of claim 1.

1                   21.     The method of claim 19, wherein said presence of estrogen  
2     signaling in said cell is used in order to determine the responsiveness of said cell to  
3     estrogen.

1                   22.     The method of claim 19, wherein said presence of estrogen  
2     signaling in said cell is used in order to determine the tissue-specific distribution of  
3     estrogen signaling in a mammal.

1                   23.     The method of claim 19, wherein said expression of said nucleic  
2     acid in said cell is detected by detecting the expression or activity of an estrogen-  
3     regulated GTP-binding protein gamma-12 subunit protein.

1                   24.     The method of claim 19, wherein said protein is the protein of  
2     claim 7.

1                   25.     The method of claim 19, wherein said expression of said nucleic  
2     acid in said cell is detected by detecting the level of estrogen-regulated GTP-binding  
3     protein gamma-12 subunit mRNA in said cell.

1                   26.     The method of claim 19, wherein the estrogen signaling is  
2     mediated by an estrogen receptor alpha.

1                   27.     A method of identifying a compound capable of acting as an  
2     estrogen receptor agonist or antagonist, the method comprising:  
3                   (1) contacting a cell comprising an estrogen receptor with said compound;  
4     and  
5                   (2) determining the functional effect of said compound on said cell,  
6     wherein an increase in the level of estrogen-regulated GTP-binding protein gamma-12  
7     subunit mRNA, protein or protein activity in said cell indicates that said compound is  
8     capable of acting as an estrogen receptor agonist, and wherein a decrease in the level of  
9     estrogen-regulated GTP-binding protein gamma-12 subunit mRNA, protein or protein  
10    activity in said cell indicates that said compound is capable of acting as an estrogen  
11    receptor antagonist.

1                   28.     The method of claim 27, wherein the estrogen receptor is an  
2     estrogen receptor alpha.

1                   29.     The method of claim 27, wherein said estrogen-regulated GTP-  
2     binding protein gamma-12 subunit mRNA has the sequence of SEQ ID NO:1, or wherein

- 3 said estrogen-regulated GTP-binding protein gamma-12 subunit protein comprises the  
4 amino acid sequence of SEQ ID No:2 or 3.

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